NAAHAR PUBLIC SCHOOL CBSE SEMNIOR SECONDARY
ACADEMIC YEAR (2022-2023)
MICRO REVISION-6

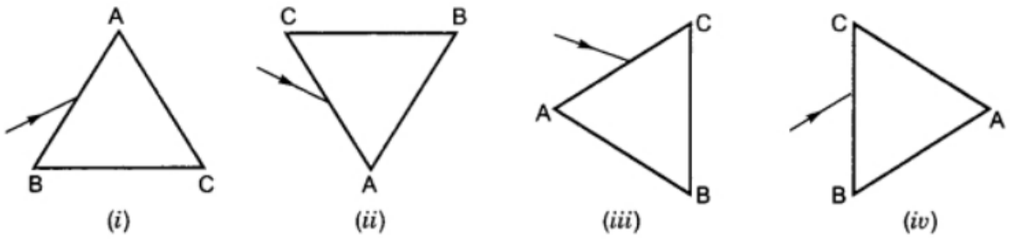
STD: X **TOTAL: 30**
SUBJECT: PHYSICS **DATE: 17.11.2022**

I. ANSWER THE FOLLOWING: **6X1=6**

1. A person cannot see distinctly objects kept beyond 2 m. This defect can be corrected by using lens of power
(a) +0.5 D
(b) -0.5 D
(c) +0.2 D
(d) -0.2 D
Answer: (b) -0.5 D

2. A student sitting on the last bench can read the letters written on the blackboard but is not able to read / the letters written in his textbook. Which of the following statements is correct?
(a) The near point of his eyes has receded away.
(b) The near point of his eyes has come closer to him.
(c) The far point of his eyes has come closer to him.
(d) The far point of his eyes has receded away.
Answer: (a) The near point of his eyes has receded away.

3. A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in the Figures given below. In which of the following cases, after dispersion, the third colour from the top corresponds to the colour of the sky?



(a) (i)
(b) (ii)
(c) (iii)
(d) (iv)
Answer: (b) (ii)

4. Having two eyes facilitates in
A: Increasing the field of view
B : Bringing three-dimensional view
C : Developing the concept of distance/ size
Then the correct option is/are
(a) A only
(b) A and B only
(c) B only
(d) A, B and C
Answer: (d) A, B and C

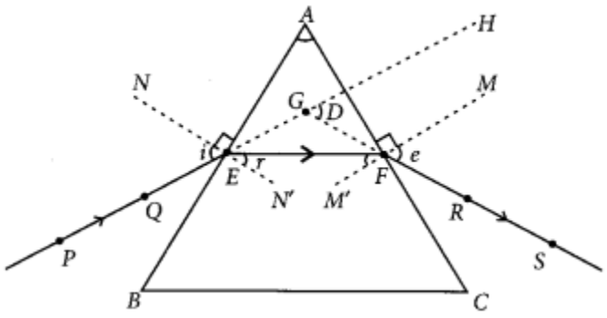
5. The black opening between the aqueous humour and the lens is called
(a) retina
(b) iris
(c) cornea
(d) pupil
Answer: (d) Pupil
Explanation:
(d) The black opening between the aqueous humor and the eye lens is called pupil.

6. Near and far points of a young person normal eye respectively are
(a) 0 and infinity
(b) 0 and 25 cm
(c) 25 cm and infinity
(d) 25 cm and 150 cm.
Answer: (c) 25 cm and infinity
Explanation:
(c) Near point = 25 cm while far point = infinity.

II. ANSWER THE FOLLOWING: **2X2=4**

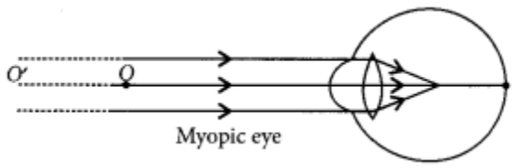
7. Define the term power of accommodation. Write the modification in the curvature of the eye lens which enables us to see the nearby objects clearly?

Answer:
The ability of the eye lens to adjust its focal length is called power of accommodation. The ciliary muscles modify the curvature to some extent. The change in the curvature of the eye lens can thus change its focal length. When the ciliary muscles contract, the lens becomes thick and its focal length decreases, thus enables us to see nearby objects clearly.
8. State the function of each of the following parts of the human Eye:
(i) Cornea (ii) Iris (iii) Pupil (iv) Retina
Answer:
(i) Cornea : It is a transparent bulge on the front surface of eyeball which refracts most of the light rays entering the eye.
(ii) Iris: Irish a dark muscular diaphragm that controls the size of the pupil.
(iii) Pupil: Refer to answer 6(iii).
(iv) Retina: It captures light and converts it into electric signals that are translated into images by the brain.
III. ANSWER THE FOLLOWING: 2X3=6
9. Name the three common defects of vision. What are their causes? Name the type of lens used to correct each of them.
Answer:
Three common defects of vision are
Myopia
Hypermetropia
Presbyopia
Myopia can be caused due to following reasons.
Elongation of eyeball.
Excessive curvature of eye lens.
Hypermetropia can be caused due to following reasons
Shortening of eyeball.
Focal length of eye lens becomes too long.
Presbyopia is caused due to gradual weakening of ciliary muscles and diminishing flexibility of eye lens due to ageing.
Correction of these defects:
Myopia can be corrected by using concave lens of appropriate focal length.
Hypermetropia can he corrected by using convex lens of appropriate local length.
Presbyopia can be corrected by using bifocal lens.
10. a. Draw a ray diagram to show the refraction of light through a glass prism. Mark on it (a) the incident ray, (b) the emergent ray and (c) the angle of deviation.
Answer:

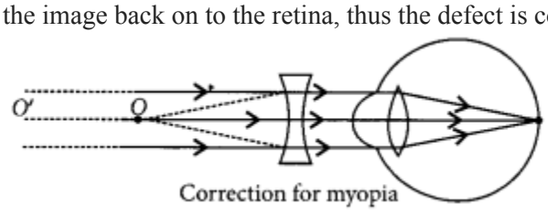


i = angle of incidence
(a) PE = incident ray
(b) FS = emergent ray
(c) ∠D = angle of deviation
b. List the parts of the human eye that control the amount of light entering into it. Explain how they perform this function?
Answer:
The part of the human eye that controls the amount of light entering into it is pupil.
Light enters the eye through a thin membrane called the cornea. It forms the transparent bulge on the front surface of the eyeball most of the refraction for the light rays entering the eye occurs at the outer surface of the cornea, the crystalline lens merely provides the linear adjustment of focal length required to focus objects at different distances on the retina. Iris which is behind the cornea controls the size of the pupil. The pupil regulates and controls the amount of light entering the eye.
III. ANSWER THE FOLLOWING: 2X5=10
11. a. A student is unable to see clearly the words written on the black board placed at a distance of approximately 3 m from him. Name the defect of vision the boy is suffering from. State the possible causes of this defect and explain the method of correcting it.
Answer:
Student is suffering from myopia.
The two possible reasons due to which the defect of vision arises are: excessive curvature of the eye lens

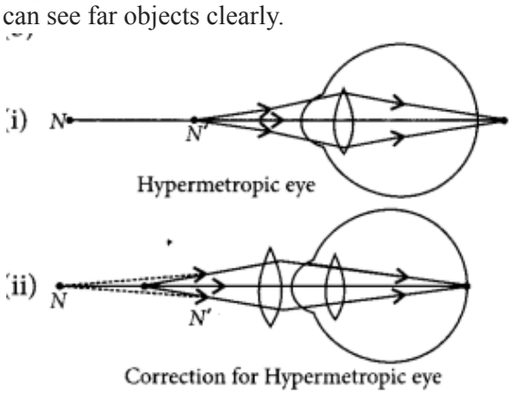
and elongation of the eye ball.
A student with myopia has the far point nearer than infinity, thus, the image of a distant object is formed in front of the retina.



Correction of myopia: This defect can be corrected by using a concave lens of suitable power as it brings the image back on to the retina, thus the defect is corrected.



b. An old man cannot see objects closer than 1 m from the eye clearly. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagram for the (i) defect of vision and also (ii) for its correction.
Answer:
The person is suffering from hypermetropia.
Hypermetropia : It is a defect in an eye in which a person is not able to see nearby object distinctly but can see far objects clearly.



c. State one function of the crystalline lens in the human eye.
Answer:
The crystalline lens of human eye focuses the light that enters the eye and form the image on the retina.
12. Write different parts of eye and explain their functions. Also explain how an image of an object is formed on the retina of eye.
Answer:
The main parts of an eye and their functions are given below :

1. **Cornea** is the outermost part of the eye. It is transparent part of eye and allows the light to enter in the eye.
2. **Iris:** It is a circular dark diaphragm having a hole in its centre. This hole is called pupil. The circular dark diaphragm has muscles and colored pigments. The color of an eye depends upon the color of these pigments.
   The function of iris is to control the size of the pupil. On the other hand, pupil controls and regulates the light entering the eye. The pupil becomes small when bright light falls on the eye. However, it becomes wide when there is dim light.
3. **Lens:** The eye lens is a crystalline double convex lens and made of transparent and flexible tissues. It is behind the pupil and held by the muscles called ciliary muscles. It focuses the images

of objects on the retina of the eye.

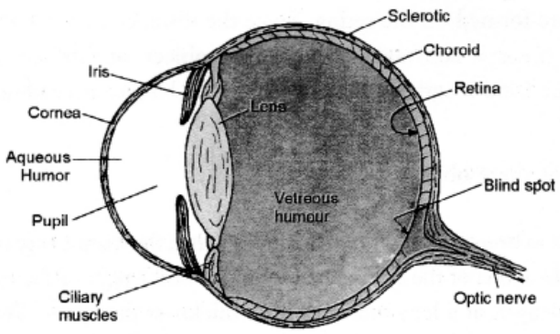
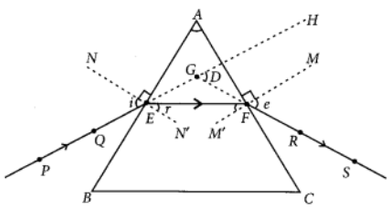


FIGURE 1. HUMAN EYE

4. **Ciliary muscles:** These muscles hold the eye lens in position. Ciliary muscles controls the focal length of the eye lens. When these muscles contracts, then the lens becomes thick and the focal length of the lens decreases. On the other hand, when ciliary muscles are relaxed, then the lens becomes thin and the focal length of the lens increases.
5. **Retina:** It acts as a light-sensitive screen to obtain the image of the object. It contains number of cells in the form of rods and cones which are sensitive to light. These cells convert light energy into electrical impulses or signals.
6. **Optic nerve:** Optic nerve is formed by the nerve fibres coming from the retina. It carries nerve or electrical impulses or signals to the brain. The brain finally interprets the signal.

CASE BASED QUESTION: (ANY FOUR) 4X1=4

13. A prism is a transparent refracting medium bounded by two plane surfaces inclined to each other at a certain angle. The refraction of light through a prism follows the laws of refraction. In the prism, refraction takes place on its refracting surface it means when the light enters the prism and when the light leaves the prism. The refraction through a prism is shown. Here, A is the angle of prism, ∠i is the angle of incidence of the face AB and ∠∠e is the angle of emergence at other face AC.



The incident ray suffers a deviation or bending through an angle δ due to the refraction through prism. This angle is called angle of deviation as shown in figure.

∠i + ∠e = ∠δ + ∠A

i) The angle between the two refracting surfaces of a prism is called
(a) Angle of prism (b) angle of incidence
(c) Angle of deviation (d) angle of emergence
(ii) The angle between the incident ray and the emergent ray is called
(a) Angle of emergence (b) angle of deviation
(c) Angle of incidence (d) none of these
(iii) When a ray is refracted through a prism, then
(a) ∠i=∠δ (b) ∠ i=∠e+∠δ
(c) ∠δ= ∠e (d) ∠i > ∠r
(iv) The angle of deviation depends on
(a) Refractive index of prism (b) angle of incidence
(c) Both (a) and (b) (d) none of these
(v) The rectangular surfaces of a prism are known as
(a) Reflecting surfaces (b) dispersing surfaces
(c) Refracting surfaces (d) none of these.

Answers:

(i) (a): The angle between the two refracting surfaces of a prism is called angle of prism.
(ii) (b): The angle between the incident ray and the emergent ray is called angle of deviation.
(iii) (d): As the ray of light enters from rarer medium (air) to denser medium (glass), the angle of incidence is more than angle of refraction.
(iv) (c): More be the refractive index, more be the angle of deviation and it also depends on the refractive index of prism.
(v) (c): The refraction of light takes place through rectangular surfaces.